GEI Consultants

December 17, 2007
Project 04516-2

Geotechnical
Environmental and
Water Resources
Engineering

Ms. Irene M. Dale
Environmental Engineer
Bureau of Waste Site Cleanup
Massachusetts Department of Environmental Protection
205B Lowell Street
Wilmington, MA 01887

Dear Ms. Dale:

Re: Immediate Response Action Plan Modification No. 10
50 Tufts Street
Somerville, MA
RTN 3-23246 (eDEP Transaction No. 157619)

On behalf of UniFirst Corporation of Wilmington, Massachusetts, GEI prepared this Immediate Response Action (IRA) Plan Modification No. 10 for the installation of Exposure Pathway Elimination Measures (EPEMs) at residences and commercial buildings located within the 50 Tufts Street site in Somerville, Massachusetts (the Site). For tracking and reporting purposes, the Massachusetts Department of Environmental Protection (DEP) has consolidated all Release Tracking Numbers (RTNs) for this Site under one number, RTN 3-23246. The Site is classified Tier IC. A Site Plan is in Figure 1.

The IRA Transmittal Form (BWSC105) for IRA Modification No. 10 was submitted by eDEP on December 17, 2007, a copy is in Attachment A. The Chief Municipal Officer and the local Board of Health have been notified of the IRA modification. Copies of the notification letters are in Attachment A.

1. CONTACT INFORMATION

Entity Undertaking the IRA:
John R. Badey
Vice President of Distribution
and Engineering
UniFirst Corporation
68 Jonspin Road
Wilmington, MA 01887
978.658.8888 ext 578

Licensed Site Professional:
Ileen S. Gladstone, P.E., LSP
Vice President
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781.721.4012
LSP License: 9719

2. BACKGROUND

Chlorinated volatile organic compounds (VOCs), particularly tetrachloroethylene (PCE), have been measured in soil, groundwater, and indoor air on portions of the Site. Based on multiple rounds of groundwater measurements, the general direction of groundwater flow at the Site is to the northeast across Tufts Street towards Knowlton and Franklin Streets. PCE has been

measured in soil gas samples collected from beneath the sub-slab and/or in indoor air samples collected at residences and buildings in the vicinity of the 50 Tufts Street property (Property).

GEI identified a study area near the Property that includes approximately 70 residential and commercial properties, which are listed on Table 1 and shown on Figure 1. GEI evaluated the potential for vapor intrusion into buildings at these properties and proposed installing a sub-slab depressurization system (SSDS) at potentially affected buildings in IRA Plan Modification No. 1 dated April 11, 2007.

GEI evaluated 66 of the 70 buildings for potential vapor intrusion. To date, GEI has proposed to undertake EPEMs in 28 buildings. Evaluations, primarily sampling to confirm the results of the first samples collected, are continuing in the other buildings. An SSDS was installed at six buildings, and other EPEMs are pending at 14 buildings. As requested by DEP, GEI provided DEP with the names and addresses of the six residential property owners who have refused the installation of permanent mitigation systems.

Based on the results of tests and inspections conducted during its evaluation, GEI concluded that an SSDS may not be the appropriate EPEM for many buildings. The geologic conditions beneath the building slab, the absence of a competent basement slab and/or the presence of fieldstone foundations may impede effective operation of an SSDS; therefore, GEI is proposing an alternative EPEM based on site specific conditions comprised of a vapor barrier and venting system – specifically, sealing the existing concrete floor and installing a vapor barrier system on the fieldstone (and brick) foundation walls, together with installation of a venting system beneath the vapor barriers.

3. IRA OBJECTIVES, PLAN, AND SCHEDULE (310 CMR 40.0424[1][E])

3.1. IRA Objectives

The purpose of this IRA Plan Modification No. 10 is (i) to identify buildings within the evaluation area at which an SSDS is not likely to be an effective mitigation strategy, and (ii) to specify a protocol for sealing the basement floors and walls and ventilating the sub-slab to eliminate the potential exposure pathways. If necessary, based on the results of post-installation performance testing, a venting system can be retrofitted with a blower.. The EPEM specified in this IRA Plan Modification applies to locations with a competent concrete basement floor and fieldstone (and brick) foundation walls.

The objectives of this IRA Plan Modification are to:

- Identify buildings where there is a competent concrete basement floor and fieldstone (and brick) foundation walls, and at which a vapor barrier and venting system will be installed;.
- Install an EPEM intended to prevent vapor intrusion by sealing the existing concrete floor and installing a vapor barrier system on the fieldstone (and brick) foundation walls.
- Monitor the effectiveness of the EPEM undertaken to confirm a level of No Significant Risk (NSR) has been achieved, using a Unit Risk Factor (URF) consistent with current science at the time post-installation confirmatory indoor air testing is performed.

3.2. Basement Inspection for Buildings Requiring Mitigation

In each of the buildings selected for mitigation, GEI will perform a basement inspection to evaluate and recommend a mitigation system. The inspection will evaluate:

- Basement slab construction
- Sub-slab soil characteristics and sub-slab air flow
- Foundation wall construction
- Utilities
- Temporary item storage volume

3.3. Vapor Pathway Mitigation Systems

Based on the inspection, GEI will recommend installing one of three vapor pathway mitigation systems:

- **Option 1: SSDS.** An SSDS is applicable to buildings with a competent concrete slab floor, concrete walls and good sub-slab air flow.
- **Option 2: Seal concrete floor, vapor barrier wall system, and venting.** Option 2 is applicable to buildings with a competent concrete floor, a fieldstone or brick foundation, and poor sub-slab air flow.
- **Option 3: New concrete floor, vapor barrier wall system, and venting.** Option 3 is applicable to buildings with a poor quality concrete or dirt basement floor, a fieldstone or brick foundation, and poor sub-slab air flow.

Option 1 was described in the IRA Plan Modification No. 1 submitted to DEP on April 11, 2007 and approved in DEP's conditional approval dated July 11, 2007. The details of Option 3 will be submitted in a separate IRA Plan Modification. IRA Plan Modification No. 10 describes and requests approval for Option 2.

3.4. Option 2: Seal Concrete Floor, and Install Vapor Barrier Wall System and Venting

Option 2 is applicable at locations with a competent concrete floor, a fieldstone or brick foundation, and poor sub-slab air flow. A schematic of the mitigation Option 2 is in Figures 2.

Option 2 consists of the following elements:

- Removing the non-permanent contents from the basement and storing them temporarily.
- Installing a vapor and moisture collection trench along the perimeter of the floor. The perimeter trench will be tied into the existing drainage and sump system, if present.
- Preparing and then applying an epoxy vapor barrier and protective cementitious coating over the existing concrete floor.
- Re-pointing interior fieldstone foundation walls with cementitious mortar.
- Installing a vapor accumulation and water drainage layer onto walls.
- Installing a rubberized vapor barrier onto fieldstone walls and over the vapor trench.

- Installing wire mesh and cementitious stucco to walls over the vapor membrane and concrete over the vapor trench.
- Plumbing the perimeter vent piping to the exterior, continuing piping to above the roofline and installing a wind-driven rotary turbine at the terminus of vertical piping above roofline.

Installation details of Option 2 are in "Vapor Barrier – Design and Installation Protocol" in Attachment B.

The Option 2 EPEM described is representative of the types of systems to be installed. The actual EPEM will be tailored to meet the circumstances of each individual building. GEI will engage a sub-contractor to implement EPEMs.

4. REMEDIATION WASTE MANAGEMENT

GEI's sub-contractor will collect sub-slab soil samples to pre-characterize the soil for off-site disposal. The soil samples will be submitted to a Massachusetts certified laboratory for analysis parameters required by the disposal facility. The laboratory and disposal facility will be retained by the sub-contractor and approved by GEI. Cuttings from sub-slab coring or excavated soil will be drummed and transported off-site as surplus material or remediation waste, depending on the results of the chemical testing. GEI estimates that between 4 cubic yards (500 square foot basement) to 10 cubic yards (2,500 square foot basement) of soil will be generated at each location; therefore, we are seeking approval for off-site disposal of up to 10 cubic yards of soil for each location.

GEI does not anticipate performing dewatering during the mitigation.

5. ENVIRONMENTAL MONITORING PLAN AND PERMITS

5.1. Tracer Test

After sealing the basement floor, and installing the vapor barrier system, GEI will confirm that potential vapor intrusion pathways (i.e. cracks, joints etc.) in the basement have been sealed by performing a "tracer test".

The tracer test will use sulfur hexafluoride (SF6) as an indicator to confirm effective operation of the vapor barrier and venting system. This tracer gas system has been utilized by many researchers, including Lawrence Berkeley Laboratories (Berkeley, California) to study the movement of soil gas into residences and has several advantages over other available techniques including smoke testing. These include: 1) the gas used has no other significant sources and therefore is unique with no interferences; 2) it can be detected using reliable portable instruments in the part per billion range; 3) it will permit quantitative detection of emissions into the basement and allow a "sniffing" mode to be used to locate a potential point of entry through the slab. The tracer system consists of installing direct injection ports into one or two representative locations in the slab that will permit a known volume of non-toxic SF6 gas to be injected into the soil beneath the slab over a prescribed time period. In a relatively short period of time, on the order of two to three weeks, an equilibrium concentration will be reached under the slab and after that will reflect the movement of the soil gas. The tracer will be monitored in the basement space using an Electron Capture Detector for quantification of SF6 concentrations in the air. Samples will be collected on a real time basis to permit emissions into the basement area to be detected.

5.2. Confirmatory Indoor Air Sampling

GEI will collect one round of confirmatory indoor air samples to assess the effectiveness of the EPEM in Site buildings. Samples will be collected in summa canisters and submitted for laboratory analysis by U.S. Environmental Protection Agency (EPA) method TO15, which is modified to only report a selected list of chlorinated VOCs of concern. After confirming the effectiveness of the EPEM via the initial post-installation tracer test and indoor air testing, GEI will collect one additional round of confirmatory indoor air samples, preferably during the winter.

5.3. Long Term Environmental Monitoring Plan

The vapor barrier provides several layers of protection against potential vapor intrusion and is not anticipated to wear or decay appreciably with time, providing the basement is kept in a state of good repair. The venting located beneath the barrier system described in Option 2 is operated by a wind-driven rotary turbine that will continue to operate regardless of power failures or mechanical malfunctions.

GEI will conduct annual inspections for two years following installation, followed by a bi-annual inspection program. The objective of the inspections is to confirm that the basement is in a good state of repair. After the completion of five inspections, modifications to the inspection schedule may be proposed to DEP.

5.4. Contingent System Modifications

The EPEM is a vapor barrier and venting system. If GEI determines, based on the tracer test and/or indoor air testing and any ensuing modifications, that the system is not achieving a condition of NSR, then GEI will install a fan on the exterior vent pipe to operate as a sub-slab depressurization system.

5.5. Permits

UniFirst will enter into an access agreement with each property owner to obtain the necessary permits from the city of Somerville and to install the mitigation system in the building.

GEI and its subcontractor will obtain necessary permits, such as building, electrical and plumbing permits, from the city of Somerville.

6. SCHEDULE

IRA activities are ongoing. The schedule for completing these activities depends on our ability to contact property owners, enter into access agreements and obtain permits from the city of Somerville. GEI will notify DEP in writing prior to installation of an EPEM at a particular location. GEI obtained verbal approval from Ms. Dale to install the Option 2 EPEM at 95R Franklin Street on November 28, 2007. GEI anticipates installing Option 2 EPEMs in additional homes over the next six months. Installation of a pathway mitigation system is anticipated to take two to three weeks. The proposed schedule is:

Activity	Timeframe
Perform basement inspections and evaluate mitigation options.	Initiated and will continue as needed depending on access.
Mail letter to property owners informing them of the proposed mitigation and enter into access agreements.	Initiated and will to continue as needed to obtain access.
Implement Option 2 mitigation.	Initiate installation of initial system at 95R Franklin Street on November 30, 2007. Installation period of approximately three weeks. Continue installation at additional homes over several months depending on access.
Tracer Test.	One to two weeks following completion of system installation.
Confirmatory indoor air monitoring.	Either concurrent with, or one to two weeks following completion of tracer test, and then once over the following year.

Please contact me at 781.721.4012 or igladstone@geiconsultants.com if you have any questions.

Sincerely,

GEI CONSULTANTS, INC.

Ileen S. Gladstone, P.E., LSP
Vice President

ISG:jah
Enclosures

c: John R. Badey, UniFirst Corporation
Peter Mills, City of Somerville

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Table 1
Properties to be Evaluated for Potential Vapor Intrusion
50 Tufts Street
Somerville, MA

2 Alston Street
6 Alston Street
12 Alston Street
16-20 Alston Street
30-40 Alston Street
142 Cross Street
74 Franklin Street
76 Franklin Street
80 Franklin Street
82 Franklin Street
86 Franklin Street
91-93 Franklin Street
95 Franklin Street
95R Franklin Street
97 Franklin Street
97R Franklin Street
99 Franklin Street
152-154 Glen Street
153-155 Glen Street
156 Glen Street
159 Glen Street
163 Glen Street
162-164 Glen Street
166-168 Glen Street

2A Hadley Court
2B Hadley Court
2C Hadley Court
9 Knowlton Street
12-14 Knowlton Street
13 Knowlton Street
17 Knowlton Street
19 Knowlton Street
23 Knowlton Street
27 Knowlton Street
29 Knowlton Street
31-33 Knowlton Street
32 Knowlton Street
35-37 Knowlton Street
4 Morton Street
7 Morton Street
6-8 Morton Street
10 Morton Street
11 Morton Street
12 Morton Street
13 Morton Street
15 Morton Street
18 Morton Street
19-19A Morton Street

21 Morton Street
9 Tufts Street
11-13 Tufts Street
17 Tufts Street
19 Tufts Street
23 Tufts Street
25 Tufts Street
27 Tufts Street
45-47 Tufts Street
49 Tufts Street
51-51a Tufts Street
53 Tufts Street
60 Tufts Street
85 Washington Street
91 Washington Street
97 Washington Street
103 Washington Street
105-107 Washington Street
111 Washington Street
113 Washington Street
117 Washington Street
121 Washington Street

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GENERAL NOTES:

1. BUILDINGS, STREET, AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
2. CAPUANO CENTER BUILDING IS BASED ON DRAWING A0.2 FROM THE ARCHITECTURAL BID SET OF "THE EDGERTY EARLY CHILDHOOD DEVELOPMENT CENTER" BY HMFH ARCHITECTS, INC., DATED AUGUST 10, 2001.

0 100 200

SCALE, FEET

IRA Plan Modification No. 10
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts

GEI Consultants

STUDY AREA

Project 04516-2 | December 2007 | Fig. 1

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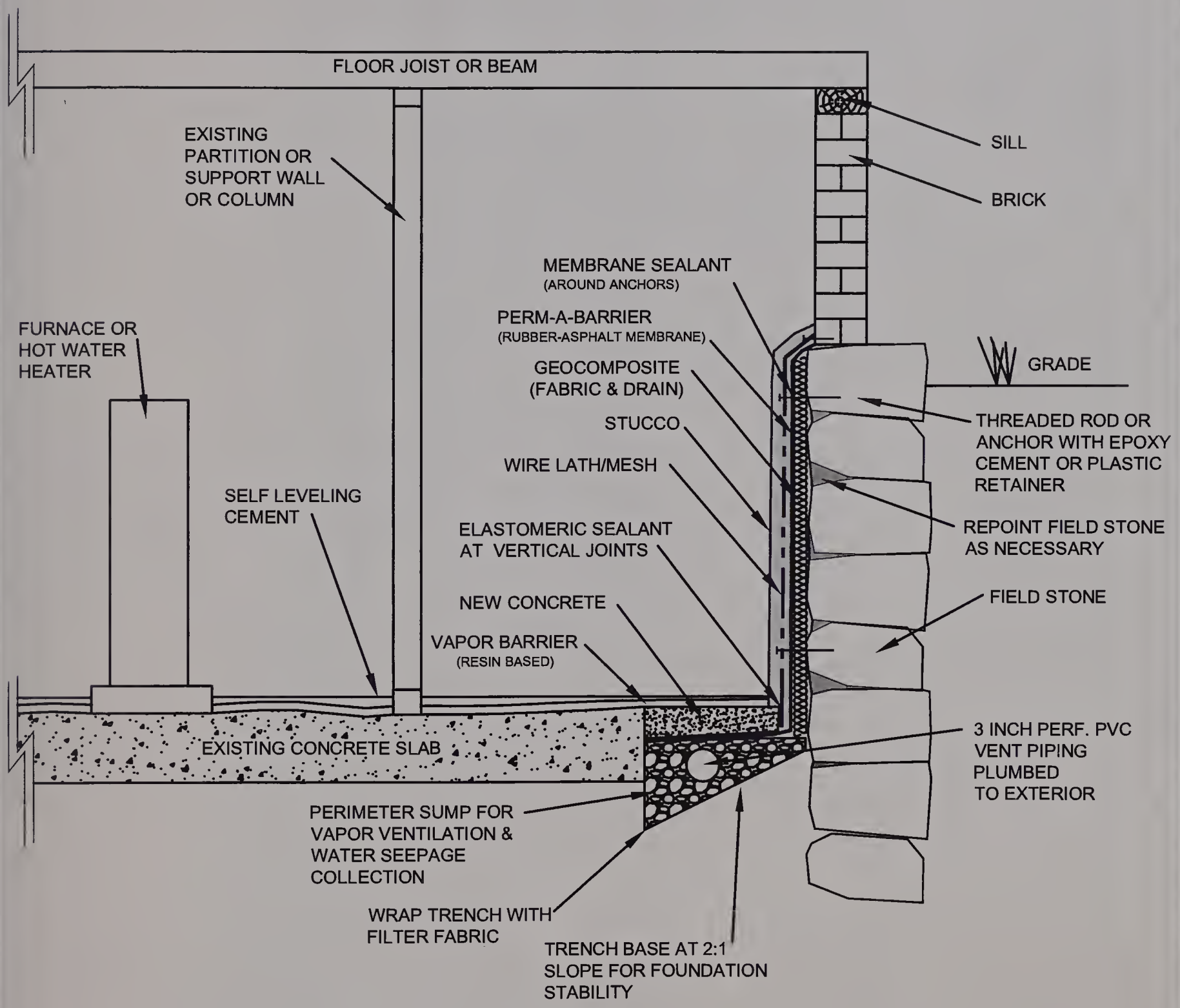

Not to Scale

IRA Plan Modification No. 10 50 Tufts Street Somerville, Massachusetts	GEI Consultants	OPTION 2: VAPOR BARRIER & VENTING SCHEMATIC PLAN
UniFirst Corporation Wilmington, Massachusetts	Project 04516-2	December 2007 Fig. 2

N:\04516\#Drafting\045160-2\IRA Plan Mod #10\045160-2 - IRA Plan Mod No 10 - 02.dwg

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ATTACHMENT A

Immediate Response Action (IRA) Transmittal Form
(BWSC105)
and Board of Health and Chief Municipal Officer Notification Letters

Massachusetts Department of Environmental Protection

eDEP Transaction Copy

Here is the file you requested for your records.

To retain a copy of this file you must save and/or print.

Username:	**JHAWKER**
Transaction ID:	**157619**
Document:	**BWSC 105 IRA**
Size of File:	**140.807 K**
Status of Transaction:	**SUBMITTED**
Date and Time Created:	**12/17/2007::4:46:51 PM**

Note: This file only includes forms that were part of your transaction as of the date and time indicated above. If you need a more current copy of your transaction, return to eDEP and select to “Download a Copy” from the Current Submittals page.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC105

IMMEDIATE RESPONSE ACTION (IRA) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart D)

Release Tracking Number: 3 - 23246

A. RELEASE OR THREAT OF RELEASE LOCATION:

1. Release Name/Location Aid: 50 TUFTS ST & PROP ACROSS THE ST

2. Street Address: 50 TUFTS ST

3. City/Town: SOMERVILLE 4. ZIP Code: 02145-4129

5. UTM Coordinates: a. UTM N: 4694322 b. UTM E: 328049

☑ 6. Check here if a Tier Classification Submittal has been provided to DEP for this disposal site.
☐ a. Tier IA ☐ b. Tier IB ☑ c. Tier IC ☐ d. Tier II

☐ 7. Check here if this location is Adequately Regulated, pursuant to 310 CMR 40.0110-0114. Specify Program (check one):
☐ a. CERCLA ☐ b. HSWA Corrective Action ☐ c. Solid Waste Management
☐ d. RCRA State Program (21C Facilities)

B. THIS FORM IS BEING USED TO: (check all that apply)

1. List Submittal Date of Initial IRA Written Plan (if previously submitted): 1/9/2006 (mm/dd/yyyy)

☐ 2. Submit an **Initial IRA Plan.**

☑ 3. Submit a **Modified IRA Plan** of a previously submitted written IRA Plan.

☐ 4. Submit an **Imminent Hazard Evaluation.** (check one)
☐ a. An Imminent Hazard exists in connection with this Release or Threat of Release.
☐ b. An Imminent Hazard does not exist in connection with this Release or Threat of Release.
☐ c. It is unknown whether an Imminent Hazard exists in connection with this Release or Threat of Release, and further assessment activities will be undertaken.
☐ d. It is unknown whether an Imminent Hazard exists in connection with this Release or Threat of Release. However, response actions will address those conditions that could pose an Imminent Hazard.

☐ 5. Submit a request to **Terminate an Active Remedial System or Response Action(s) Taken to Address an Imminent Hazard.**

☐ 6. Submit an **IRA Status Report.**

☐ 7. Submit a **Remedial Monitoring Report.** (This report can only be submitted through eDEP.)
a. Type of Report: (check one) ☐ i. Initial Report ☐ ii. Interim Report ☐ iii. Final Report
b. Frequency of Submittal: (check all that apply)
☐ i. A Remedial Monitoring Report(s) submitted monthly to address an Imminent Hazard.
☐ ii. A Remedial Monitoring Report(s) submitted monthly to address a Condition of Substantial Release Migration.
☐ iii. A Remedial Monitoring Report(s) submitted concurrent with a IRA Status Report.
c. Number of Remedial Systems and/or Monitoring Programs: _____

A separate BWSC105A, IRA Remedial Monitoring Report, must be filled out for each Remedial System and/or Monitoring Program addressed by this transmittal form.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC105

IMMEDIATE RESPONSE ACTION (IRA) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart D)

Release Tracking Number: 3 - 23246

B. THIS FORM IS BEING USED TO (cont.): (check all that apply)

☐ 8. Submit an **IRA Completion Statement.**

☐ a. Check here if future response actions addressing this Release or Threat of Release notification condition will be conducted as part of the Response Actions planned or ongoing at a Site that has already been Tier Classified under a different Release Tracking Number (RTN) . When linking RTNs, rescoring via the NRS is required if there is a reasonable likelihood that the addition of the new RTN(s) would change the classification of the site.

b. Provide Release Tracking Number of Tier Classified Site (Primary RTN): ☐ - ☐

These additional response actions must occur according to the deadlines applicable to the Primary RTN. Use the Primary RTN when making all future submittals for the site unless specifically relating to this Immediate Response Action.

☐ 9. Submit a **Revised IRA Completion Statement.**

(All sections of this transmittal form must be filled out unless otherwise noted above)

C. RELEASE OR THREAT OF RELEASE CONDITIONS THAT WARRANT IRA:

1. Identify Media Impacted and Receptors Affected: (check all that apply)

☑ a. Air ☑ b. Basement ☑ c. Critical Exposure Pathway ☑ d. Groundwater ☑ e. Residence

☐ f. Paved Surface ☐ g. Private Well ☐ h. Public Water Supply ☑ i. School ☐ j. Sediments

☐ k. Soil ☐ l. Storm Drain ☐ m. Surface Water ☐ n. Unknown ☐ o. Wetland ☐ p. Zone 2

☐ q. Others Specify: _____

2. Identify Oils and Hazardous Materials Released: (check all that apply)

☐ a. Oils ☑ b. Chlorinated Solvents ☐ c. Heavy Metals

☐ d. Others Specify: _____

_____

D. DESCRIPTION OF RESPONSE ACTIONS: (check all that apply, for volumes list cumulative amounts)

☐ 1. Assessment and/or Monitoring Only
☐ 2. Temporary Covers or Caps
☐ 3. Deployment of Absorbent or Containment Materials
☐ 4. Temporary Water Supplies
☐ 5. Structure Venting System
☐ 6. Temporary Evacuation or Relocation of Residents
☐ 7. Product or NAPL Recovery
☐ 8. Fencing and Sign Posting
☐ 9. Groundwater Treatment Systems
☑ 10. Soil Vapor Extraction
☐ 11. Bioremediation
☐ 12. Air Sparging

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC105

IMMEDIATE RESPONSE ACTION (IRA) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart D)

Release Tracking Number: 3 - 23246

D. DESCRIPTION OF RESPONSE ACTIONS (cont.): (check all that apply, for volumes list cumulative amounts)

☑ 13. Excavation of Contaminated Soils

☑ a. Re-use, Recycling or Treatment ☐ i. On Site Estimated volume in cubic yards _____

☑ ii. Off Site Estimated volume in cubic yards 61

iia. Receiving Facility: STABLEX; QUEBEC, CANADA Town: BOSTON State: MA

iib. Receiving Facility: _____ Town: _____ State: _____

iii. Describe: _____

☐ b. Store ☐ i. On Site Estimated volume in cubic yards _____

☐ ii. Off Site Estimated volume in cubic yards _____

iia. Receiving Facility: _____ Town: _____ State: _____

iib. Receiving Facility: _____ Town: _____ State: _____

☐ c. Landfill

☐ i. Cover Estimated volume in cubic yards _____

Receiving Facility: _____ Town: _____ State: _____

☐ ii. Disposal Estimated volume in cubic yards _____

Receiving Facility: _____ Town: _____ State: _____

☐ 14. Removal of Drums, Tanks or Containers:

a. Describe Quantity and Amount: _____

b. Receiving Facility: _____ Town: _____ State: _____

c. Receiving Facility: _____ Town: _____ State: _____

☑ 15. Removal of Other Contaminated Media:

a. Specify Type and Volume: SPENT GRANULAR ACTIVATED CARBON
12,000 LBS

b. Receiving Facility: RINECO Town: BENTON State: AR

c. Receiving Facility: _____ Town: _____ State: _____

☑ 16. Other Response Actions:

Describe: TEMPORARY AIR PURIFIERS AND/OR SUB-SLAB DEPRESSURIZATION SYSTEMS

☐ 17. Use of Innovative Technologies:

Describe: _____

E. LSP SIGNATURE AND STAMP:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and 309 CMR 4.03(2), and (iii) the provisions of 309 CMR 4.03(3), to the best of my knowledge, information and belief,

> *if Section B of this form indicates that an* ***Immediate Response Action Plan*** *is being submitted*, the response action(s) that is(are) the subject of this submittal (i) has (have) been developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is(are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) complies(y) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> *if Section B of this form indicates that an* ***Imminent Hazard Evaluation*** *is being submitted*, this Imminent Hazard Evaluation was developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and the assessment activity(ies) undertaken to support this Imminent Hazard Evaluation comply(ies) with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000;

> *if Section B of this form indicates that an* ***Immediate Response Action Status Report*** *and/or a* ***Remedial Monitoring Report*** *is(are) being submitted*, the response action(s) that is (are) the subject of this submittal (i) is (are) being implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> *if Section B of this form indicates that an* ***Immediate Response Action Completion Statement*** *or a request to* ***Terminate an Active Remedial System or Response Action(s) Taken to Address an Imminent Hazard*** *is being submitted*, the response action(s) that is(are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is(are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal.

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

1. LSP #: 9719

2. First Name: ILEEN S 3. Last Name: GLADSTONE

4. Telephone: 7817214012 5. Ext.: 6. FAX:

7. Signature: ILEEN S GLADSTONE

8. Date: 12/17/2007
(mm/dd/yyyy)

9. LSP Stamp:

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC105

IMMEDIATE RESPONSE ACTION (IRA) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart D)

Release Tracking Number: 3 - 23246

F. PERSON UNDERTAKING IRA:

1. Check all that apply: ☐ a. change in contact name ☐ b. change of address ☐ c. change in the person undertaking response actions

2. Name of Organization: UNIFIRST CORP

3. Contact First Name: JOHN R 4. Last Name: BADEY

5. Street: 68 JONSPIN RD 6. Title:

7. City/Town: WILMINGTON 8. State: MA 9. ZIP Code: 01887-0000

10. Telephone: 8003477888 11. Ext.: 12. FAX:

G. RELATIONSHIP TO RELEASE OR THREAT OF RELEASE OF PERSON UNDERTAKING IRA:

☑ 1. RP or PRP ☐ a. Owner ☐ b. Operator ☐ c. Generator ☐ d. Transporter

☑ e. Other RP or PRP Specify: OTHER PRPS

☐ 2. Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

☐ 3. Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))

☐ 4. Any Other Person Undertaking IRA Specify Relationship:

H. REQUIRED ATTACHMENT AND SUBMITTALS:

☐ 1. Check here if any Remediation Waste, generated as a result of this IRA, will be stored, treated, managed, recycled or reused at the site following submission of the IRA Completion Statement. If this box is checked, you must submit one of the following plans, along with the appropriate transmittal form.

☐ a. A Release Abatement Measure (RAM) Plan (BWSC106) ☐ b. Phase IV Remedy Implementation Plan (BWSC108)

☐ 2. Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.

☑ 3. Check here to certify that the Chief Municipal Officer and the Local Board of Health were notified of the implementation of an Immediate Response Action taken to control, prevent, abate or eliminate an Imminent Hazard.

☐ 4. Check here to certify that the Chief Municipal Officer and the Local Board of Health were notified of the submittal of a Completion Statement for an Immediate Response Action taken to control, prevent, abate or eliminate an Imminent Hazard.

☐ 5. Check here if any non-updatable information provided on this form is incorrect, e.g. Release Address/Location Aid. Send corrections to the DEP Regional Office.

☑ 6. Check here to certify that the LSP Opinion containing the material facts, data, and other information is attached.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC105

IMMEDIATE RESPONSE ACTION (IRA) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart D)

Release Tracking Number: 3 - 23246

I. CERTIFICATION OF PERSON UNDERTAKING IRA:

1. I, JOHN R. BADEY, attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

2. By: JOHN R. BADEY (Signature) 3. Title:

4. For: UNIFIRST CORP (Name of person or entity recorded in Section F) 5. Date: 12/14/2007 (mm/dd/yyyy)

☐ 6. Check here if the address of the person providing certification is different from address recorded in Section F.

7. Street: _____

8. City/Town: _____ 9. State: _____ 10. ZIP Code: _____

11. Telephone: _____ 12. Ext.: _____ 13. FAX: _____

YOU ARE SUBJECT TO AN ANNUAL COMPLIANCE ASSURANCE FEE OF UP TO $10,000 PER BILLABLE YEAR FOR THIS DISPOSAL SITE. YOU MUST LEGIBLY COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE.

Date Stamp (DEP USE ONLY:)

Received by DEP on

12/17/2007 4:31:48 PM

December 17, 2007
Project 04516-2

GEI Consultants

Ms. Noreen Burke
City Hall Annex – Health Department
50 Evergreen Avenue
Somerville, MA 02145

Geotechnical
Environmental and
Water Resources
Engineering

Dear Ms. Burke:

Re: Immediate Response Action Plan Modification
50 Tufts Street, Somerville, MA
EP RTN: 3-23246

On behalf of the UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. is notifying your office of a modification to the Immediate Response Action (IRA) Plan that is being conducted at 50 Tufts Street (the Site). Chlorinated VOCs, particularly PCE, have been measured in soil, groundwater, and indoor air on portions of the Site.

GEI has conducted an evaluation of buildings in the vicinity of 50 Tufts Street to investigate soil vapor and indoor air as a potential exposure pathway to PCE. Based on the results of that evaluation, GEI has determined that different remedial options are appropriate in different buildings depending on soil conditions, construction characteristics, and other site-specific factors. Therefore, GEI has prepared a modification to the ongoing IRA Plan to:

- Identify those buildings at which sub-slab depressurization systems (SSDS) or alternative Exposure Pathway Mitigation Systems (EPEMs) are indicated;
- Describe the vapor barrier and venting systems to be installed as EPEMs; and .
- Provide a plan for testing and monitoring the effectiveness of the EPEMs to be installed.

This notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1403(3)(b). If you have any questions, please contact me at 781.721.4012.

Very truly yours,

GEI CONSULTANTS, INC.

Ilcen S. Gladstone, P.E., LSP
Vice President

ISG:jah
c: Irene Dale, Massachusetts Department of Environmental Protection
John R. Badey, UniFirst Corporation

December 17, 2007
Project 04516-2

GEI Consultants

Mr. Peter Mills
Somerville City Hall
93 Highland Avenue
Somerville, MA 02145

Geotechnical
Environmental and
Water Resources
Engineering

Dear Mr. Mills:

Re: Immediate Response Action Plan Modification
50 Tufts Street, Somerville, MA
EP RTN: 3-23246

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Very truly yours,

GEI CONSULTANTS, INC.

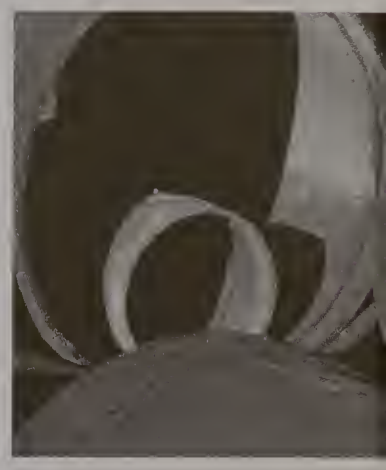
Ileen S. Gladstone, P.E., LSP
Vice President

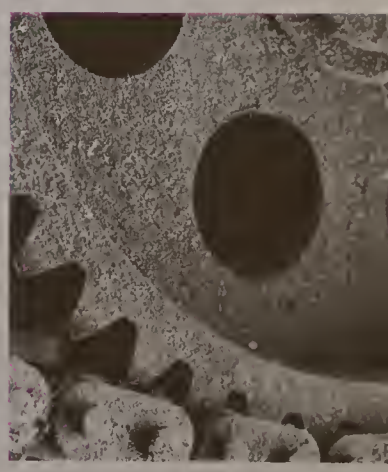
ISG:jah
c: Irene Dale, Massachusetts Department of Environmental Protection
John R. Badey, UniFirst Corporation

GEI Consultants, Inc.
400 Unicorn Park Drive, Woburn, MA 01801
781.721.4000 fax: 781.721.4073

GEI Consultants

Geotechnical
Environmental and
Water Resources
Engineering





ATTACHMENT B

Vapor Barrier – Design and Installation Protocol

50 Tufts Street Site
Option 2 Vapor Barrier and Venting System – Generic Design and Installation Protocol

This protocol describes the proposed vapor mitigation system installation procedure to mitigate potential migration of volatile organic compound (VOC) vapors from below grade into indoor air at buildings within the 50 Tufts Street Site in Somerville, Massachusetts.

1. Contractor mobilization and basement preparation:

   a. Coordinate building, electrical, plumbing and gas fitting, and fuel oil storage permits with GEI and the City of Somerville Inspectional Services Division and Wire Inspector. Coordinate utility service interruption with electric, natural gas, and water with providers. Obtain parking permits and police details, as necessary.

   b. Protect first floor living space from item removal and mitigation system installation processes where access to basement is from the interior only (e.g., plastic sheeting and floor protection)

   c. Contractor will remove stored items necessary to conduct the work and provide temporary storage of these items either on or off site depending on exterior space available at the property.

      i. Appliances like washers, dryers, and dehumidifiers will be removed and reinstalled.

      ii. Basement wall coverings, non-structural walls/partitions, and shelving will be removed. Non-structural walls/partitions and shelving will be reinstalled. Wall coverings will be not be reinstalled unless approved by GEI.

      iii. Insure temporarily stored items against damage.

      iv. Photo document items removed from residences if requested by GEI.

   d. Inspect basement once it has been emptied to adjust design and protocol for site specific requirements, (e.g., old furnaces, bathrooms, partitions, wall coverings, non-structural walls, etc.). Prepare a written inspection report documenting any changes to this protocol.

   e. Dust ventilation and barrier:

      i. Attach 6-mil minimum thickness polyethylene, or equivalent, sheeting to basement ceiling and doors to minimize dust and fume migration into living space.

      ii. Set up, run, and remove exhaust fans to create negative pressure in basement during mitigation installation. Vent exhaust to exterior through HEPA filter and if necessary through activated carbon filtration.

   f. Where there are limited areas for staging of excavated soil, use the following procedure for excavated soil disposal pre-characterization:

i. Core opening in floor slab in at least three perimeter locations to collect a composite soil sample and a VOC grab sample for disposal pre-characterization.

ii. Pre-characterization soil samples will be analyzed by a Massachusetts certified laboratory for parameters required by the disposal facility. The laboratory and disposal facility will be retained by the Contractor and approved by GEI. Contractor will coordinate transport and disposal documentation, UniFirst will sign soil disposal documents as the generator. Soil that is classified as mitigation waste will be shipped using a Bill of Lading, GEI will provide an LSP to sign the BOL. [NOTE: should this be Remediation Waste rather than mitigation waste? Do we need this – i.e., will there be any?]

2. Venting system installation – basement:

a. Install extraction point(s) near center of structure and/or chimney, or as recommended by GEI. Core a 4-inch diameter hole in floor slab then remove sub grade to create an approximately 10-inch diameter cavity and install pipe into open cavity. Seal pipe to the slab via epoxy resin sealant, or equivalent.

b. Saw cut perimeter concrete floor slab for installation of a 1.5-foot wide perimeter venting and water seepage trench.

c. Contractor will excavate perimeter venting and seepage trench to a depth of 1.5 feet, slope trench away from foundation, manage excavated soil, and appropriately dispose of soil off site.

d. Test excavated soil for VOCs.

e. Install filter fabric prior to backfilling trench with stone. Install and compact stone prior to installing vent piping. Install internal perimeter 3-inch perforated PVC passive vent piping. Place and tamp stone around and above perforated piping.

f. Incorporate existing sump pump system (if present) into perimeter venting and seepage trench. Incorporation may include installation of a sump vessel with a sealed cover, electrical supply, and discharge piping.

g. Use 3-inch diameter schedule 40 PVC pipe to plumb the perimeter vent piping to the exterior at the sill elevation and continue piping to above the roofline.

h. Install wind-driven rotary turbine at terminus of vertical piping above roofline.

3. Foundation wall system:

a. Remove loose paint, mortar, coatings, and dirt from the brick and fieldstone walls via wire brush and vacuum.

b. Re-point field stone wall with appropriate Portland cement mixture as necessary.

c. Install drainage layer composite comprised of drainage grid material and geo-fabric using mechanical fasteners and liquid adhesive to the below grade portion of the foundation walls.

d. Apply rubberized asphalt membrane to fabric side of drainage composite with 3-inch shiplap joints and roll joints.

e. Drill approximately 3/8-inch holes through membrane, drainage composite, and at least 2-inches into fieldstone. Anchors will be installed into stones and not mortar joints. Install approximately 3/8-inch anchors/threaded rod through composite and membrane with epoxy cement into predrilled holes. Anchors will be installed at an approximately 3-foot grid spacing and top and bottom of fieldstone and brick portions of foundation walls.

f. Seal around anchor/rods with rubberized asphalt liquid sealant or equivalent.

g. Install stucco 2-inch square lath/mesh with building paper backing over entire wall and tie off to anchor/rods.

h. Pour or pump (3,000 psi minimum 28 day strength) concrete cap to cover passive vent trench and tie in base of wall lath/mesh.

i. Apply elastomeric sealant at vertical joints (i.e, new/old concrete, stucco/brick, or stucco/new concrete).

j. Apply 1-inch thick cementitious stucco to lath/mesh.

4. Concrete floor vapor barrier installation:

a. Clean existing surface and apply concrete floor leveler approved by epoxy resin manufacturer, if necessary.

b. Clean surface including removal of dust, laitance, grease, curing compounds, bond inhibiting materials, waxes, and other potential interferences with the epoxy bonding process.

c. Apply low VOC epoxy resin primer to prepare surface for epoxy vapor barrier.

d. Apply low VOC epoxy resin to floor in accordance with manufacturer recommendations and allow curing for at least 24 hours.

e. Apply protective top coating comprised of cementitious floor leveler approved by epoxy resin manufacturer.

5. Tracer Test

   a. Install tracer gas injection points through the existing concrete slab into pre-existing sub-slab material. The injection points are to be located generally equidistant from the perimeter soil vapor trench and venting locations near the center of the basement foot print. One injection point will be installed per 750 square feet of basement concrete slab. Injection points will be installed via the following:

      i. Core 6-inch diameter hole through existing slab and remove pre-existing material to a depth of 3 feet below the slab using a vacuum or hand auger. (If the water table is encountered shallow than 3-feet then advance injection point to 1.0 feet above water table)

      ii. Install ¼ inch threaded stainless steel tubing, Teflon thread sealer, and Swagelok valve with the top of the valve 1-inch below the top of the existing concrete slab. Backfill with Ottawa sand to 2.5 feet below the slab.

      iii. Backfill hole around stainless steel tubing with a Portland cement plug to 4-inches below top of concrete slab.

      iv. Install 6-inch outer diameter water-tight flush mounted road box into cored hole and fresh Portland cement. Apply elastomeric sealant to road box flare prior to setting road box.

      v. Apply elastomeric sealant to the top of Portland cement plug inside road box.

      vi. Float finish Portland cement over existing slab and road box flare to fill gap between slab and road box above elastomeric sealant.

      vii. Install road box cover with pentagon center bolt and expandable o-ring.

6. Contractor demobilization:

   a. Containerize and dispose of all construction wastes.

   b. Dispose of construction waste off site at a licensed construction waste material disposal facility.

   c. Reinstall and/or replace shelving, non-structural walls/partitions, appliances, bathrooms, etc.

   d. Return temporarily stored items to basement.

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